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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
VO, TUNG T	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/807,654	OKAMOTO ET AL.	
	Examiner	Art Unit	
	Tung T. Vo	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *03* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-11, 16-24, 28-29 rejected under 35 U.S.C. 102(e) as being anticipated by Schofield et al. (US 6.498,620 B2).

Re claim 1, Schofield discloses an image processing apparatus comprising:

an image processing part (18 of fig. 5) for receiving images captured by a plurality of cameras (14 and 16 of fig. 7) shooting surroundings of a vehicle (12 of fig. 1) to generate a synthetic image (col. 5, lines 59-64) viewed from a virtual point of view (col. 6, lines 1-4) from these camera images (col. 5, line 65-col. 6, line 4),

wherein the image processing part (18 of fig. 5) changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view in accordance with a running state of the vehicle (col. 21, line 41-col. 22, line 6) note the image

processor (18) responds to the temporal and spatial patterns of infrared signals detected by image capture devices (cameras 14, 16) in order to determine (selected) the speed and distance and, thereby, the separation of the vehicles as well as the rate of change of separation of the vehicles as considered a running state of the vehicle).

Re claim 2, Schofield further discloses wherein the image processing part (18 of fig. 5) changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view in accordance with a running speed of the vehicle (fig. 10 and fig. 11, note when the vehicle turns to the left or right, a position is changed so that the image capture devices (14 and 16 of fig. 5) picks up a new images based upon the changed position).

Re claim 3, Schofield further discloses wherein the image processing part (18 of fig. 5) changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view, and controls capturing of an image outside a view range of the changed virtual point of view (col. 14, lines 1-29, see also fig. 7, note distances R, S, P1 and P2).

Re claim 4, Schofield further discloses wherein the image processing part (18 of fig. 5) controls the capturing of an image outside a view range of the changed virtual point of view by changing a model for image synthesis (an object).

Re claim 5, Schofield further discloses wherein the image processing part changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view in accordance with a steering angle of the vehicle (XVII of fig. 12, see also col. 17, lines 31-36).

Re claim 6, Schofield further discloses wherein the vehicle includes an object detection sensor (176 of fig. 21, note the object sensor 176 may be a distance-measuring device, such as

an active infrared sensor, an ultrasonic sensor, a radar sensor, or the like. Such object sensor is especially useful in determining the separation distance between the vehicle and objects in front of the vehicle. Preferably, object sensor 176 has a sensing field of view that is substantially coincident with the field of view of one or more of the image capture devices 14, 16) for detecting an obstacle, and the image processing part changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view in accordance with results of detection by the object detecting sensor (176 of fig. 21).

Re claim 7, Schofield further discloses wherein the image processing part (18 of fig. 5) includes an original mapping table (col. 14, lines 30-56) and generates a synthetic image using a mapping table that is cut out from the original mapping table, and the image processing part changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view by changing the mapping table to be cut out from the original mapping table (col. 14, lines 54-56).

Re claim 8, Schofield further discloses an image processing apparatus comprising (fig. 21) an image processing (18 of fig. 21) part for receiving images captured by a plurality of cameras (14 and 16 of fig. 21) shooting surroundings of a vehicle (10 of fig. 1) to generate a synthetic image viewed from a virtual point of view from these camera images,

wherein the image processing part (18 of fig. 21) controls capturing of an image outside a view range of the virtual point of view in accordance with a running state of the vehicle (col. 14, lines 1-7).

Re claim 9, Schofield further discloses a monitoring system comprising: a plurality of cameras (14 and 16 of fig. 21) shooting surroundings of a vehicle; an image processing part (18

of fig. 21) for receiving images captured by the plurality of cameras to generate a synthetic image viewed from a virtual point of view from these camera images;

a display part (20 of fig. 7) for displaying the synthetic image, wherein the image processing part changes at least one selected from a position, a direction of a line of sight, and a focal length of the virtual point of view in accordance with a running state of the vehicle (100 and 174 of fig. 21).

Re claims10, 16, Shimizu further discloses an image processing apparatus comprising an image processing part (18 of fig. 21) for receiving images captured by a plurality of cameras (14 and 16 of fig. 21) shooting surroundings of a vehicle to generate a synthetic image from these camera images,

wherein the image processing part (18 of fig. 21) generates an image including a first image (the captured image is from the camera 14 or 16) as the synthetic image,

the second image being viewed (fig. 3, the right image being viewed on the display is different from the left image) from a viewpoint that is different from the virtual point of view of the first image in at least one selected from a position, a direction of a line of sight and a focal length, or the second image being different from the first image in a model ().

Re claim 11, Schofield further discloses wherein the second image is at least one of the camera images (fig. 3).

Re claims 17 and 23, Schofield further discloses an image processing apparatus comprising:

an image processing part (18 of fig. 2) for receiving images captured by a plurality of cameras (14 and 16 of fig. 7) shooting surroundings of a vehicle (10 of fig. 1) to generate a synthetic image from these camera images, wherein in the synthetic image,

the image processing part (20 of fig. 5 and a display 20 of fig. 3) displays at least a part of a vehicle region (42 of fig. 3) where the vehicle is present, and an attention drawing region (Lanes, 70A, 70B of fig. 6) for drawing attention in which at least a part of the surroundings of the vehicle is shown.

Re claim 18, Schofield discloses wherein the synthetic image is an image viewed from a virtual point of view that is set above the vehicle (fig. 3).

Re claim 19, Schofield further discloses wherein the image processing part displays an illustration image or an actual image of the vehicle on the vehicle region (20 of fig. 3, see also col. 7, line 47-col. 8, line 12).

Re claims 20-21, Schofield further discloses wherein the attention drawing region includes at least a part of a blind spot region around the vehicle that is not shot by any of the cameras (20 of fig. 3, note the display (20) is displaying the image that includes a part of blind spot. See also col. 9, lines 17-36).

Re claim 22, Schofield further discloses wherein the image processing part determines a range of a region obtained by combining the blind spot region and the vehicle region, using region data showing a projection region of the vehicle in each camera image (76 of fig. 14; see also col. 9, lines 7-11).

Re claim 24, Schofield discloses an image processing apparatus comprising an image processing part (18 of fig. 5) for receiving images captured by a plurality of cameras (14 and 16

of fig. 5) shooting surroundings of a vehicle to generate a synthetic image from these camera images, wherein the image processing part (18 of fig. 5) generates the synthetic image, using a mapping table (col. 14, lines 30-56) including first mapping data describing a correspondence relationship between pixels of the synthetic image and pixels of the camera images (Left image and Right image are from the outputs of the cameras 14 in figure 5, see also fig. 3), and second mapping data describing an identifier showing that a pixel of the synthetic image corresponds to pixel data other than the camera images (58 of fig. 3), and Schofield further discloses wherein the pixel data other than the camera images show the vehicle or a blind spot region that is present in at least a part of the surroundings of the vehicle (70A and 70B of fig. 6).

Re claims 28 and 29, Schofield discloses an image processing apparatus comprising an image processing part (18 of fig. 5) for receiving images captured by a plurality of cameras (14 and 16 of fig. 5) shooting surroundings of a vehicle to generate a synthetic image from these camera images,

wherein the image processing part uses mapping data (col. 14, lines 30-56) describing a correspondence relationship between pixels of the synthetic image and a plurality of pixel data including one or both of pixel data of the camera images and pixel data other than the camera images, and describing a rate of necessity with respect to each of the pixel data, and weights each pixel data in accordance with the rate of necessity, thereby generating the pixel data of the pixels of the synthetic image (col. 14, line 54-col. 15, line 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 10-15 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schofield et al. (US 6,498,620 B2) in view of Shimizu (US 5,796,991).

Re claims 10-15, and 24-27, Schofield teaches an image processing apparatus comprising an image processing part (18 of fig. 5) for receiving images captured by a plurality of cameras (14 and 16 of fig. 5) shooting surroundings of a vehicle to generate a synthetic image from these camera images, wherein the image processing part (18 of fig. 5) generates the synthetic image, using a mapping table (col. 14, lines 30-56) including first mapping data describing a correspondence relationship between pixels of the synthetic image and pixels of the camera images (Left image and Right image are from the outputs of the cameras 14 in figure 5, see also fig. 3), and second mapping data describing an identifier showing that a pixel of the synthetic image corresponds to pixel data other than the camera images (58 of fig. 3); wherein the pixel data other than the camera images show the vehicle or a blind spot region that is present in at least a part of the surroundings of the vehicle (70A and 70B of fig. 6).

It is noted that Schofield does not teach the image processing part stores a predetermined image other than the camera images, and with respect to the pixel of the synthetic image, the second mapping data describe coordinate values corresponding to the pixel in the stored predetermined image; wherein the first image is a close view image showing the vehicle and

surroundings thereof, and the second image is a distant view image showing an area distant from the surrounding area of the vehicle that is shown by the close view image; wherein the image processing part arranges the distant view image around the close view image in the synthetic image; wherein the distant view image is an image having continuity with the close view image as claimed

However, Shimizu further discloses wherein the image processing part stores a predetermined image other than the camera images (CG MODEL DATABASE, 244 of fig. 7), and with respect to the pixel of the synthetic image (213 of fig. 7), the second mapping data describe coordinate values corresponding to the pixel in the stored predetermined image (CG IMAGE FORMING UNIT, 235 of fig. 7); wherein the second image is at least one of the camera images (201L and 201R of fig. 7); wherein the first image is a close view image showing the vehicle and surroundings thereof, and the second image is a distant view image showing an area distant from the surrounding area of the vehicle that is shown by the close view image (fig. 6 A, fig. 10A-10E); wherein the image processing part arranges the distant view image around the close view image in the synthetic image (figs. 6A and 6B); wherein the distant view image is an image having continuity with the close view image (figs. 10A-10E); wherein the first image shows at least a part of the vehicle and at least a part of the surroundings of the vehicle, and the second image is obtained by enlarging at least a part of the region shown by the first image (figs. 10A-10E).

Taking the combined teachings of Schofield and Shimizu as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Shimizu into the image processing part (18 of fig. 5) of Schofield for the same purpose of synthesizing the images with

the predetermined model. Doing so would provide a natural appearance among images of virtual objects and an improved simulation environment.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Endo et al. (US 6,335,754 B1) discloses synchronization between image data and location information for panoramic image synthesis.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TUNG T VO
PATENT EXAMINER

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